

Major Operations on Patients with Poliomyelitic Impairment

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■ *Pertinent data on operations (other than orthopedic) carried out in 39 patients who had residual impairment from poliomyelitis were reviewed with a view to appraising what additional operative risk there may be for such patients.*

For a large proportion of the patients, equipment to aid respiration was needed and a large proportion of the operations were urologic procedures as might be expected in a group with generally restricted physical activity. Also, the occurrence of complications was higher than for an ordinary surgical service. Even so, the experience indicated that residual impairment from poliomyelitis ought not be considered a contraindication even of elective, let alone emergency operations.

WHEN MAJOR SURGICAL OPERATION is proposed for patients with diminished respiratory reserve or decreased locomotor ability residual from poliomyelitis, extra care must be taken in planning the procedure, and equipment must be provided for assisting respiration.

Yet in the recent medical literature there is very little material on this particular subject. In 1945 Metheny and Olson² presented the case of a 29-year-old patient confined to a respirator who was operated on for acute appendicitis, with successful outcome. Neu and McCarthy³ in 1956 reported the case of a 27-year-old man with vital capacity of 1035 ml who underwent left lower lobectomy for bronchiectasis.

Joos, Talner and Wilson¹ in 1956 reported on a series of 17 respirator patients, aged 16 through 35 years, who among them had 21 surgical procedures. Fourteen of the 21 were major operations. The vital capacity of the patients ranged from 5 to 30 per cent of normal. These investigators concluded that "practically any surgical procedure that is clearly indicated can be carried

out on these patients without much added risk over that incurred in any patient, but with the need of special care and preparation."

Urologic surgical procedures in postpoliomyelitic patients was the subject of reports by Taylor, Alcock and Hildes⁵ on 13 patients, and by O'Connor and Wiener⁴ on seven operations on five patients. These observers agreed that the basic cause of the increased calculus formation in patients of this type is prolonged immobility which results in demineralization of bone and hypercalciuria.

Present Study

To add to the rather lean literature on this subject, the medical records of all patients with residual impairment from poliomyelitis who were operated on at Rancho Los Amigos Hospital during the period 1958 through 1963 were reviewed. Orthopedic operations were excluded and the material remaining for study was 62 surgical procedures in 39 patients (Table 1). There were 21 females and 18 males. The age of the patients ranged from 2 to 63 years with an average of 30 years. Twenty-eight of the patients had had bul-

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bulbospinal poliomyelitis, six were quadriplegic and five were paraplegic.

Equipment to aid respiration was needed for 24 patients. The vital capacity varied from less than 1 per cent of normal to 90 per cent. These 24 patients had 36 complications associated with the surgical procedures.

The length of stay in hospital that was related to the surgical operation ranged from 6 to 190 days and the average was 32 days. There was one postoperative death.

Operative Procedures

Urinary Tract

Seventeen patients, nine male and eight female, had among them 25 operative procedures on the urinary tract (Table 2). The age range was 7 to 43 years and the average 26 years. Fifteen of the patients had had bulbospinal poliomyelitis and two were quadriplegic. For 13 of them respiratory assistance was needed. The vital capacity ranged from 1 per cent to 58 per cent of normal. Nineteen complications of operation occurred in 12 patients (Table 3). The duration of stay in hospital varied from 8 to 190 days, averaging 49. There were no operative deaths in this group.

Gastrointestinal Tract

Fourteen patients had among them 16 operations on the gastrointestinal tract involving the performance of 19 surgical procedures (Table 4). Eight of the patients were female, six male. The age range was 15 to 63 years and the average 38 years. Eight patients had impairment from bulbospinal poliomyelitis, three were paraplegic and three were quadriplegic. Respiratory equipment

TABLE 1.—Operative Procedures on Patients with Poliomyelitis, 1958-1963

Location	Number
Urinary tract	25
Gastrointestinal tract	19
Female reproductive tract.....	6
Intrathoracic	6
Miscellaneous	6
Total	62

TABLE 2.—Operative Procedures on the Urinary Tract

Procedure	Number
Ureterolithotomy	7
Nephrolithotomy with nephrostomy ⁴	5
Pyelolithotomy with nephrostomy ¹	7
Nephrectomy	4
Pyeloplasty	2
Total	25

was needed for ten patients. The vital capacity varied from 1 per cent to 60 per cent of normal. Seven patients had 12 complications related to the operation (Table 5). The duration of hospital stay ranged from 6 to 46 days, the average being 16 days. One patient, a 26-year-old man who had had gastrostomy, died of atelectasis and pneumonia 19 days after operation.

Intrathoracic Operations

Six patients, three male and three female, had intrathoracic procedures — lobectomy in three

TABLE 3.—Morbidity Associated with Urinary Tract Operations

Complication	Number
Wound infection.....	6
Pyelonephritis	4
Recurrent stone formation.....	2
Pneumonia	2
Ileus	1
Bacteremia	1
Septicemia	1
Grand mal seizure	1
Gastric hemorrhage	1
Total	19

TABLE 4.—Operative Procedures on the Gastrointestinal Tract

Procedure	Number
Cholecystectomy	6
Gastrostomy	6
Appendectomy	4
Subtotal gastrectomy	1
Choledochostomy	1
Repair esophageal hiatal hernia.....	1
Total	19

TABLE 5.—Morbidity Associated with Gastrointestinal Tract Operations

Complication	Number
Atelectasis	4
Pneumonia	3
Ileus	1
Hypotension	1
Subphrenitis	1
Wound infection	1
Thrombophlebitis	1
Total	12

TABLE 6.—Miscellaneous Operative Procedures

Procedure	Number
Abdominal exploration	2
Lumbar sympathectomy	2
Orchiectomy	1
Hemithyroidectomy	1
Total	6

cases, thoracotomy for cardiac arrest in three. Four of the patients had residual effect from bulbo-spinal poliomyelitis, one was quadriplegic and one was paraplegic. For two of them respiratory equipment was needed. The vital capacity varied from 3 per cent to 90 per cent of normal. Two patients had postoperative complications, pneumonia in one case, acute gastritis in the other. Stay in hospital ranged from 12 to 60 days and the average was 36. There were no operative deaths in this group.

Female Reproductive Tract

Four women had four operations on the reproductive tract, in which six surgical procedures were done, abdominal hysterectomy in three cases and salpingo-oophorectomy in three. The age of the patients ranged from 29 to 48 years, the average being 37. Three of the patients had impairment from bulbo-spinal poliomyelitis and one of them was quadriplegic. Equipment to aid in respiration was needed for two patients. The vital capacity varied from 10 to 60 per cent of normal. Postoperative complications occurred in two cases, ileus in one, atelectasis in the other. Stay in hospital ranged from 16 to 19 days and the average was 13 days. There were no operative deaths.

Miscellaneous Operations

Six patients, four female and two male, had operations not included in the classifications already discussed (Table 6). The age range was 10 to 54 years (average 31 years). Three patients had residual damage from bulbo-spinal poliomyelitis and three were paraplegic. For three of them respiratory equipment was needed. The vital capacity varied from 8 to 90 per cent of normal. One patient had a postoperative complication—pneumonia. The shortest stay in hospital was six days, the longest 13 days and the average nine days. There were no postoperative deaths.

Discussion

As the average age of the patients in this series was only 30 years and the oldest was only 63, the chronic medical diseases of the aged, which are known to play a prominent role in the morbidity and mortality associated with major surgical procedures, were not a considerable factor.

The variety of surgical procedures performed was in keeping with what might be expected in a predominantly young group. The preponderance of urologic procedures reflects the known difficulty of avoiding calculus disease of the urinary tract

in bedridden patients. In a series of this kind, gastrostomy in six of 39 patients cannot be considered inordinately high, since the procedure is one that is helpful in the rehabilitation of patients who have difficulty in swallowing as a residual impairment of poliomyelitis.⁶

One of the most obvious features in this series was respiratory deficiency. For 24 of the 39 patients, mechanical respiratory equipment was needed to maintain adequate ventilation. The average vital capacity of all patients was 26 per cent of normal. Taking this fact and the generally good results together, diminished respiratory reserve ought not be considered a contraindication even to elective, let alone emergency operation. As long as adequate facilities and nursing care are available, the great majority of patients can be carried through postoperative convalescence quite safely. The one death in the series was caused by pneumonia and atelectasis, but as with any death in a situation of greater than normal risk, the possible hazards must be weighed against the necessity for operation.

The incidence of complications was higher than would be expected for an average surgical service. The highest incidence was associated with operations on the gastrointestinal and urinary tracts and the complications were mainly respiratory or urologic in nature. Atelectasis and pneumonia frequently delayed the recovery of patients who had decidedly diminished vital capacity. Among patients with calculus disease of the upper respiratory tract, pyelonephritis was a frequent complication. The difficulty in treating renal calculus disease in patients of this category is reflected in the multiplicity of surgical procedures—25 operations for 17 patients.

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